

Serial Number 09/915,260

IN THE TITLE:

Please delete the original title and substitute therefore the following new title:

–Pulse Propelled Flat Induction Motor With Rotor Position Capability–.

REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Formalities

The specification has been revised to correct various minor idiomatic and grammatical errors, and the title has been amended in the manner suggested by the Examiner. Because the changes are all clearly formal in nature, it is respectfully submitted that the changes do not involve new matter.

2. Rejections of Claims 1, 5, and 9 Under 35 USC §102(b) and of Claims 2-4, 6-8, and 10-12 under 35 USC §103(a), in view of U.S. Patent No. 5,959,382 (Dauwalter)

These rejections are respectfully traversed on the grounds that the Dauwalter patent does not disclose or suggest the following features of the invention recited in independent claims 1, 5, and 9, and in each of the claims that depends therefrom:

- a. a propulsion system in which a portion of an apparatus to be driven, such as a wheel, brake disk, propeller, fan blade assembly, or the like, is formed by the rotor of a flat induction motor (claims 1, 5, and 9);
- b. a flat induction rotor that includes slots that extend into the rotor, reducing the weight of the rotor and serving to enable detection of rotor position (claims 1, 5, and 9); and
- c. slots that extend through the rotor (claims 13-15) to, for example, form spokes (claims 3, 7, and 11).

Instead, the Dauwalter patent discloses a toothed stepper motor in which the teeth protrude or project outwardly from the rotor for defining the relative positions of two actuator members, such as the fixed and movable members of a relay.

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The claimed invention is based on the realization that if the wheels of a vehicle (or driven parts of other apparatus such as a propeller or fan blade assembly) are made of a suitable metal, the wheels or other driven parts can serve as rotors of an induction motor system, thereby eliminating the need for a drive train connecting the motor and the wheels or other driven parts. Furthermore, the invention adds the feature in which slots are extended into (and, more specifically through) the rotor, thereby reducing the weight of the rotor and at the same time providing reference points for detection of rotor position (necessary to control torque or angular velocity of the motor).

While the notches between the teeth of the motor of Dauwalter are arguably "slots," they are clearly not slots that extend into or through the rotor as now claimed. To the contrary, the rotor of Dauwalter would be inoperative if the slots extended all the way through the rotor since positioning of the rotor, as is necessary to accomplish such stated purposes as the positioning of disk read/write heads of data storage devices, depends on magnetic interaction between the stator poles and the corresponding poles on the rotor. Such magnetic interaction locks the actuator in a precisely determined position for a desired period of time, and enables rapid changes of position by permitting rapid deceleration following rapid acceleration as the movable member is moved to the desired track. This is in contrast to the propulsion system of the invention, in which the stopping position of the motor makes no difference.

Whereas the claimed invention controls the stator current solely for the purpose of propulsion control, *i.e.*, control of vehicle speed, Dauwalter controls the current flow in the stator in order to achieve precise positioning of the rotor relative to the stator. This is a fundamentally different arrangement than that of the claimed invention.

The present invention is especially suitable for use in an "HPV" (electric motor-power assisted human powered vehicle, such as a "moped") because of its light weight. Rapid acceleration is not a consideration as it is in the Dauwalter system, and on the other hand, weight and size are important considerations. The arrangement of Dauwalter is much less flexible than

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that of the claimed invention, which merely needs to rotate at a desired speed, and is not concerned with achieving a precise stopping position.

None of the references cited in the application to date discloses or suggests use of a driven part of an apparatus, such as a wheel, as an induction motor rotor in order to eliminate the need for differentials, torque converters, drive chains, and/or other parts of the drive train of a conventional vehicle, or the claimed slots which serve to enable smooth operation of the motor by providing a reference, and which further reduce the weight of the motor and enhance its appearance.

Because the Dauwalter patent does not disclose or suggest all elements recited in independent claims 1, 5, and 9 and the claims that depend therefrom, withdrawal of the rejections under 35 USC §102(b) and 103(a) is respectfully requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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